

FOR FURTHER INFORMATION CONTACT:
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address (601/960-4900 or FTS 490-4900)

SUPPLEMENTARY INFORMATION:

Background

Cambarus zophonastes is an albinist cave crayfish endemic to the White River Basin in north-central Arkansas (Smith 1984). This obligate cave crayfish was first collected in 1961 and described in 1964 from five specimens taken from the type locality (Hobbs and Bedinger 1964). *Cambarus zophonastes* lacks pigment in the body and eyes, which are reduced, and the overall body length reaches about 65mm. It can be distinguished from related species by the following features of its carapace: the rostrum has strongly convergent margins bearing spines, and the areola is more than 29 times longer than wide. The species is known from only the type locality and only eight specimens are known to exist in zoological collection. Over 170 additional caves in north-central Arkansas have been searched without *Cambarus zophonastes* being found. A survey of 436 caves and ten springs in Missouri revealed two close related species (*Cambarus hubrichti* and *Cambarus setosus*) but failed to reveal *Cambarus zophonastes* (Smith 1984).

The type locality is situated in the Ozark Mountains, and the cave is formed in the Plattin Limestone (Hobbs and Bedinger 1964). This cave is a solution channel, most of which is wet year-round. It contains much mud, and many of its passages are flooded during storms and wet seasons. About 150 feet (45 meters) inside the cave is a pool ranging from 1 to at least 20 feet (0.3-7 meters) in depth with a narrow, shallow stream entering it from the cave's interior. This stream flows through 1.4 feet (425 meters) of cave passage (Smith 1984). Water from the cave emerges at three springs located about 150 feet (45 meters) from the cave entrance. The crayfish has been found only in the cave pool. The Arkansas Natural Heritage Commission and The Nature Conservancy recently purchased a 160-acre (65-hectare) tract that includes the cave's entrance. The primary recharge area consists of 3.51 square miles (9 square kilometers) (Aley and Aley 1984) and is largely privately owned. Population trends for *Cambarus zophonastes* have not been documented. The largest number of individuals sighted during a single trip was 15 crayfish recorded by a scuba diver in 1983. The total population is estimated to be fewer than 50 individuals (Smith 1984).

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Proposed Endangered Status for *Cambarus Zophonastes*

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: The Service proposes to determine a cave crayfish, *Cambarus zophonastes*, to be an endangered species under the authority contained in the Endangered Species Act of 1973, as amended. This obligate cave dweller has been found only in one cave in Stone County, Arkansas. The species does not have an accepted common name. Groundwater contamination, collecting, and low population levels represent major potential threats to *Cambarus zophonastes*. Groundwater contamination is especially important because most of the stream channels in the cave's recharge area are sinking streams, which can readily introduce pollutants or contaminants into the cave system. This proposal, if made final, will implement the protection of the Endangered Species Act of 1973, as amended, for this cave crayfish. The Service seeks relevant data and comments from the public.

DATES: Comments from all interested parties must be received by July 7, 1986. Public hearing requests must be received by June 19, 1986.

ADDRESS: Comments and materials concerning this proposal should be sent to the Endangered Species Field Station, U.S. Fish and Wildlife Service, Jackson Mall Office Center, Suite 316, 300 Woodrow Wilson Avenue, Jackson, Mississippi 39213. Comments and materials received will be available for public inspection, by appointment, during normal business hours at the above address.

Summary of Factors Affecting the Species

Section 4(a)(1) of the Endangered Species Act (16 U.S.C. 1531 *et seq.*) and regulations promulgated to implement the listing provisions of the Act (50 CFR Part 424) set forth the procedures for adding species to the Federal lists. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). These factors and their application to *Cambarus zophonastes* (no common name) are as follows:

A. *The present or threatened destruction, modification, or curtailment of its habitat or range.* Groundwater contamination represents a major threat to *Cambarus zophonastes*. The only known population is in a geographic area characterized by sinking streams. A sinking stream is a surface water course that loses significant quantities of water into the subsurface in very localized areas. Sinking streams are of extreme importance in supplying water and nutrients to caves. This rapid flow of water into caves also allows the easy introduction of pollutants. A hydrological study of the area (Aley and Aley 1985) has identified threats to this system. An electrical transmission line crosses the recharge area for this cave. The use of herbicides to clear the right-of-way for this line could contaminate the cave. A State highway borders the recharge area for the cave and is a potential source for accidental spills of materials hazardous to water quality. A 4,000 gallon (15,140 liter) spill of gasoline occurred on the highway in March 1985. There are three industrial operations within the cave recharge area that threaten the water quality. All three industries store petroleum products that could spill or leak into the cave. One of the industries, a concrete plant, contributes silt to the cave when its sediment ponds overflow (Aley and Aley 1985). The City of Mountain View has grown rapidly and will likely expand into the topographic basin, within which some subdivision roads have already been built. Continuing development presents a major threat to water quality in the cave from the use of septic tanks to dispose of wastewater.

B. *Overutilization for commercial, recreation, scientific, or educational purposes.* Obligate cave species characteristically live longer and have considerably lower reproductive capacities than their surface relatives. Cooper (1975), in his study of crayfish in Shelta Cave, Alabama, found the cave species *Orconectes australis* to have only 10 to 60 attached ova, while surface

species of *Orconectes* had up to 574 attached ova. *Cambarus zophonastes* probably also has low reproductive capabilities. The removal of adults from a limited population with a likely low reproductive potential would seriously endanger the existence of the population. With a maximum of 15 individuals of *Cambarus zophonastes* ever observed and with a total population estimate of 50 individuals, the removal of any reproducing females would dramatically impact and could eliminate a year's recruitment. The limited habitat and population size make the species vulnerable to vandalism and taking.

C. *Disease or predation.* Disease and predation have not been documented for this species.

D. *The inadequacy of existing regulatory mechanisms.* This species is not recognized or protected as a rare species by any existing Federal or State regulation. Arkansas requires a scientific collecting permit for collecting any species, except taking for fish bait under other State regulations. This affords very limited protection owing to the difficulty of apprehending violators and limited resources for law enforcement.

E. *Other natural or manmade factors affecting its continued existence.* Obligate cave species apparently have very low reproductive rates, as evidenced by the limited information available on other cave species (Poulson 1961). This low reproductivity is partially due to the limited energy availability in caves. This cave likely served as a maternity roost site for gray bats (*Myotis grisescens*), a species listed as endangered, at one time in the past (Harvey *et al.* 1981). The abandonment of this roost site represents a loss of energy input, in the form of guano, to the cave's aquatic community. This loss of energy reduces the available food supply and may have limited or reduced the population size of *Cambarus zophonastes*. Reproduction of *Cambarus zophonastes* is further impacted by low numbers of mature individuals, which reduces genetic diversity and the likelihood of successful mating encounters. Low reproductive capabilities and the small, single population naturally limit this species' ability to recover from any adversity.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by this species in determining to propose this rule. Based on this evaluation, the preferred action is to list *Cambarus*

zophonastes as endangered. Endangered status was chosen because this species is known from only one cave system with an estimated population of only 50 individuals. The species is especially vulnerable to water quality degradation at this site. It therefore requires the greatest possible protection available under the Act. The reason critical habitat is not being proposed is discussed in the next section.

Critical Habitat

Section 4(a)(3) of the Act, as amended, requires that to the maximum extent prudent and determinable, the Secretary designate any habitat of a species which is considered to be critical habitat at the time the species is determined to be endangered or threatened. The Service finds that designation of critical habitat is not prudent for this species at this time. As discussed under Factor B in the "Summary of Factors Affecting the Species," *Cambarus zophonastes* is endangered by taking, an activity difficult to prevent. Publication of critical habitat descriptions would make this species even more vulnerable and increase enforcement problems. All involved parties and land owners will be notified of the location and importance of protecting this species' habitat. Protection of this species' habitat will be addressed through the recovery process and through the section 7 jeopardy standard (see below). Therefore, it would not be prudent to determine critical habitat for *Cambarus zophonastes* at this time.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Endangered Species Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies, groups, and individuals. The Endangered Species Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. Such actions are initiated by the Service following listing. The protection required of Federal agencies and the prohibitions against taking and harm are discussed, in part, below.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is being

designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR Part 402, and now under revision (see proposal at 48 FR 29990; June 29, 1983). Section 7(a)(4) requires Federal agencies to confer with the Service on any action that is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat. If a species is listed subsequently, section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service. Federal involvement with this species is expected to be minimal. The continuing development of this region could lead to sub-surface water degradation that may involve the Environmental Protection Agency or other agencies with jurisdiction over groundwater. The Federal Housing Authority may be required to consult with the Service on Federal loans for housing development within the cave's recharge area.

The Act and implementing regulations found at 50 CFR 17.21 set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to take, import or export, ship in interstate commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. It also is illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered wildlife species under certain circumstances. Regulations governing permits are at 50 CFR 17.22 and 17.23. Such permits are available for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in connection with otherwise lawful activities. In some instances, permits may be issued during a specified period of time to relieve undue economic hardship that would be

suffered if such relief were not available.

Public Comments Solicited

The Service intends that any final rule adopted will be accurate and as effective as possible in the conservation of endangered or threatened species. Therefore, any comments or suggestions from the public, other concerned governmental agencies, the scientific community, industry, or any other interested party concerning any aspect of this proposed rule are hereby solicited. Comments particularly are sought concerning:

- (1) Biological, commercial trade, or other relevant data concerning any threat (or lack thereof) to *Cambarus zophonastes*;
- (2) The location of any additional populations of *Cambarus zophonastes* and the reasons why any habitat should or should not be determined to be critical habitat as provided by Section 4 of the Act;
- (3) Additional information concerning the range and distribution of this species; and
- (4) Current or planned activities in the subject area and their possible impacts on *Cambarus zophonastes*.

Final promulgation of the regulation on *Cambarus zophonastes* will take into consideration the comments and any additional information received by the Service, and such communications may lead to adoption of a final regulation that differs from this proposal.

The Endangered Species Act provides for a public hearing on this proposal, if requested. Requests must be filed within 45 days of the date of the proposal. Such requests must be made in writing and addressed to the Endangered Species Field Supervisor (see ADDRESSES section).

National Environmental Policy Act

The Fish and Wildlife Service has determined that an Environmental Assessment, as defined by the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244).

Literature Cited

Aley, T., and C. Aley. 1985. Water Quality Protection Studies Hell Creek

Cave, Arkansas. A contract report for the Arkansas Natural Heritage Commission.

Cooper, J.E. 1975. Ecological and Behavioral Studies in Shelta Cave, Arkansas, with Emphasis on Decapod Crustaceans. Ph. D. Dissertation, University of Kentucky.

Harvey, M.J., J.J. Cassidy, and G.G. O'Hagan. 1981. Endangered Bats of Arkansas: Distribution, Status, Ecology, and Management. A report to Arkansas Game and Fish Commission, Little Rock.

Hobbs, H.H., Jr., and M.S. Bedinger. 1964. A New Troglobitic Crayfish of the Genus *Cambarus* (Decapoda, Astacidae) from Arkansas with a Note on the Range of *Cambarus cryptodytes* Hobbs. Proc. Biol. Soc. Wash., 77:9-15.

Poulson, T.L. 1961. Cave Adaptation in Amblyopsid Fishes. Ph. D. Dissertation, University of Michigan.

Smith, K.L. 1984. The Status of *Cambarus zophonastes* Hobbs and Bedinger, An Endemic Cave Crayfish from Arkansas. A status survey report for the U.S. Fish and Wildlife Service.

Author

The primary author of this proposed rule is James Stewart (see ADDRESSES section).

List of Subjects in 50 CFR Part 17

Endangered and threatened wildlife, Fish, Marine mammals, Plants (agriculture).

Proposed Regulation Promulgation

PART 17—[AMENDED]

Accordingly, it is hereby proposed to amend part 17, Subchapter B of Chapter I, Title 50 of the Code Federal Regulations, as set forth below:

1. The Authority citation for Part 17, continues to read as follows:

Authority: Pub. L. 93-205, 87 Stat. 884; Pub. L. 94-359, 90 Stat. 911; Pub. L. 95-632, 92 Stat. 3751; Pub. L. 96-159, 93 Stat. 1225; Pub. L. 97-304, 96 Stat. 1411 (16 U.S.C. 1531 *et seq.*).

2. It is proposed to amend § 17.11(h) by adding the following, in alphabetical order under CRUSTACEANS, to the List of Endangered and Threatened Wildlife:

§ 17.11 Endangered and threatened wildlife.

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(h) * * *

Species		Historic range	Vertebrate population where endangered of threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
CRUSTACEANS							
Crayfish (no common name)	<i>Cambarus zophonastes</i>	U.S.A. (AR)	NA	E		NA	NA

Dated: March 28, 1986.

P. Daniel Smith,

*Acting Assistant Secretary for Fish and
Wildlife and Parks.*

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